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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,625

11/05/2003

Jianmin Wang

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EXAMINER

AKANBI, ISIAKA O

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/700,625	Applicant(s) WANG ET AL.	
	Examiner ISIAKA O. AKANBI	Art Unit 2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-11,15-18,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-11,15-18,21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 April 2008 has been entered. Claims 21 and 22 have been added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-11, 15-18 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fielden et al. (6,917,419 B2) in view of Toida (5,428,447).

Regarding to claims 1, 11 and 21, Fielden teaches of an apparatus/method for measuring surface topography of a surface comprising:

a linearly polarized light source (**figs. 3 and 4: 44**) that generates a light beam;

optics (**fig. 4: 48**) that focus the light beam on a surface to be measured such that a normally incident beam deflection is provided, the optics including polarization optics such that the incident beam has a first polarization and a reflected beam from the surface has a second polarization different from the first polarization, the optics including:

a wave plate (**figs. 3 and 4: 48**) that receives the light beam from the linearly polarized light source;

a long working distance microscope objective (**focusing lenses/additional focusing lenses**)(**col. 38, lines 34-35**)(**fig. 4: 48**) positioned to receive the light beam as an input from the wave plate and output a converging light beam; and

a polarizing beam splitter (**fig. 3: 50**) having a 45° reflective surface positioned to reflect/receive as an input the output of the wave plate and produce as an output a light beam (i.e. converging) with the first polarization from the long working microscope objective (**fig. 3: 48**)(**col. 38, lines 28-43**) towards the surface (**fig. 3: 40**) in a normally incident direction to the surface; and

a position sensitive detector (**figs. 3 and 4 : 38**) (**fig. 3: 46**)(**col. 38, lines 16-27**) positioned to detect the reflected beam (**col. 37, lines 57-col. 38, line 3**), and

Further, Fielden teaches of optical component (**figs. 3 and 4: 48**) that is capable of being arranged in the same manner as recited in the instant application claims 1, 11 and 21, that may includes beam splitters or dichroic mirrors, quarter wave plates, polarizers such as linear and circular polarizers, focusing lens and additional lenses coupled to or disposed within the illumination system or detection system (**figs. 3 and 4:**

38)(figs. 3 and 4)(col. 38, lines 28-col. 40, line 33) and thus meet the limitations such as optics that focus the light beam on a surface to be measured such that a normally incident beam deflection is provided, the optics including polarization optics such that the incident beam has a first polarization and a reflected beam from the surface has a second polarization different from the first polarization, the optics including: a wave plate that receives the light beam from the linearly polarized light source;

a long working distance objective positioned to receive the light beam as an input from the wave plate and output a converging light beam; and a polarizing beam splitter positioned to receive as an input the output of the wave plate and produce as an output a light beam with the first polarization; and a position sensitive detector positioned to detect the reflected beam

Fielden is silent regarding the optics specifically having a half-wave plate that receives the light beam. However, the use of (i.e. $\lambda/2$ wave plate) to receive light beam from a linearly polarized light source is known in the art.

Further, Toida from the same field of endeavor teaches the use of half-wave plate (**fig.6: 128**) that receive light beam (**figs. 5-7)(col. 26, line 36-col. 29, line 5-10)**. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provide optics that includes a half-wave plate that receives the light beam because it is easier to adjust/rotates the direction of the polarization of the beam than adjusting the source.

As to claims 5 and 15, Fielden also discloses the limitations wherein the optics further include a quarter-wave plate (**figs. 3 and 4: 48**) positioned to receive as an input the light beam with the first polarization and output a beam in a direction normally incident to the surface (**figs. 3 and 4: 40**)(**col. 38, lines 53-56**), the reflected beam from the surface being reflected by the quarter-wave plate (**figs. 3 and 4: 52**)(**col. 38, lines 58-61**) towards the position sensitive detector (**figs. 3 and 4: 48**) and wherein the step of changing the polarization includes passing the reflected beam through a quarter-wave plate that changes the polarization of the reflected beam to the second polarization from the first polarization (**this is inherent part of the detection system of figs. 3 and 4**).

As to claims 6 and 16, Fielden when modified by Toida fails to specify which polarization (**p-polarization or s-polarization**) is first or second. However, since the wave-plate can be set to a default or un-actuated polarizing state (s or p), there is no reason to specify which polarization is first or second.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to provide a first polarization that is p-polarization and a second polarization that is s-polarization for the purpose of providing a light beam having a polarization state (p or s) at a level determined by the detector.

As to claim 7, Fielden also discloses wherein the polarizing beam splitter (**fig. 3: 50**) includes a 45° reflective surface positioned to reflect the beam reflected from the surface (**fig. 3: 40**) in a direction perpendicular to the direction normally incident to the surface.

As to claim 8, Fielden further discloses wherein the long working microscope objective **(figs. 3 and 4: 48)(col. 38, lines 28-43)** outputs the converging light beam in a direction perpendicular to a normally incident direction to the surface **(figs. 3 and 4: 40)**.

As to claim 9, Fielden also discloses wherein the optics further include a polarizing beam splitter **(fig. 3: 50)** having a 45° reflective surface positioned to reflect the converging light beam from the long working microscope objective **(fig. 3: 48)(col. 38, lines 28-43)** towards the surface **(fig. 3: 40)** in a normally incident direction to the surface.

As to claims 10 and 22, Fielden also discloses the limitations wherein the optics further include a quarter-wave plate positioned to receive as an input the light beam with the first polarization from the polarizing beam splitter and output a beam that is normally incident of the surface, with a reflected beam from the surface having the second polarization and directed by the quarter-wave plate through the polarizing beam splitter in a direction normal to the surface towards the position sensitive detector **(fig. 3)(col. 38, lines 28-61)**.

As to claim 17, Fielden further Fielden discloses wherein the step of directing a beam of light includes directing the converging beam in a direction perpendicular to a normally incident direction to the surface towards a reflective surface of a polarizing beam splitter **(fig. 3: 50)** that reflects the converging beam towards the surface in a direction normally incident to the surface **(fig. 3: 40)**.

As to claim 18, Fielden also discloses wherein the step of directing the reflected beam includes transmitting the reflected beam through the polarizing beam splitter (**fig. 3: 50**) in a normal direction to the surface towards the position sensitive detector (**fig. 3: 46**)(col. 38, lines 16-27).

Additional Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The references listed in the attached form PTO-892 teach of other prior art apparatus/method for measuring surface topography of a surface.

Response to Arguments

Applicant's arguments with respect to claim1, 5-11 and 15-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on (571) 272-2287. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2886

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isiaka Akanbi

June 30, 2008

/TARIFUR R CHOWDHURY/

Supervisory Patent Examiner, Art Unit 2886